

Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget, Subsystems 4.5 and 4.6 Test Plan

Release 4

Version 7

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Preface

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System (DMS) supports the data processing needs of the CERES Science Team research to increase understanding of the Earth's climate and radiant environment. The CERES Data Management Team works with the CERES Science Team to develop the software necessary to support the science algorithms. This software, being developed to operate at the Langley Atmospheric Sciences Data Center (ASDC), produces an extensive set of science data products.

The DMS consists of 12 subsystems; each subsystem contains one or more Product Generation Executables. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Test Plan is written by the responsible CERES subsystem team for the CERES Configuration Management Team and the Langley ASDC to support subsystem testing. This document describes the software and supporting data files for this Subsystem and explains the procedures for installing, executing, and testing the software in the Science Software Integration and Testing environment. A section is also included on validating the software results.

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1.0 Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS) program. The [CERES](#) instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as [ERBS](#), was successfully developed in [ERBE](#) to reduce time sampling errors. CERES continues that strategy by flying instruments on the polar orbiting [EOS](#) platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation and to improve the consistency between the cloud parameters and the radiation fields, CERES includes cloud imager data and other atmospheric parameters. The [TRMM](#) satellite carries one CERES instrument while the EOS satellites carry two CERES instruments, one operating in a fixed azimuth plane scanning mode (FAPS) for continuous Earth sampling and the other operating in a rotating azimuth plane scan mode (RAPS) for improved angular sampling.

1.1 Document Overview

This document, [CERES Inversion to Instantaneous Top-of-Atmosphere \(TOA\) Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Release 4 Test Plan](#), is part of the CERES Subsystems 4.5 and 4.6 Release 4 delivery package provided to the Langley Atmospheric Sciences Data Center (ASDC). It provides a description of the CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Release 4 software and explains the procedures for installing, executing, and testing the software. A section is also included on validating the software results. A description of acronyms and abbreviations is provided in [Appendix A](#), a directory structure diagram is contained in [Appendix B](#), and a description of the software and data files is contained in [Appendix C](#).

This document is organized as follows:

[Section 1.0](#) - Introduction

[Section 2.0](#) - Software and Data File Installation Procedures

[Section 3.0](#) - Test and Evaluation Procedures

[Appendix A](#) - Acronyms and Abbreviations

[Appendix B](#) - Directory Structure Diagram

[Appendix C](#) - File Description Tables

1.2 Subsystem Overview

1.2.1 CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processors and HDF Post Processor

The Main Processor Product Generation Executives (PGE) CER4.5-6.1P1, CER4.5-6.1P2, and CER4.5-6.1P3, CERES Inversion to Instantaneous TOA Fluxes and the Empirical Estimates of Surface Radiation Budget, Subsystems 4.5 and 4.6, convert CERES filtered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint. The output of the Subsystems 4.5 and 4.6 Main Processor PGE CER4.5-6.1P1, which is for TRMM VIRS-only processing, consists of a binary Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF) product, which serves as input for CERES Subsystem 5.0 and Subsystem 9.0, an ASCII Quality Control (QC) report, and a binary QC file. The output of the Subsystems 4.5 and 4.6 Main Processor PGE CER4.5-6.1P2, which is for Terra processing, consists of a binary Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF) product, a binary SSF Aerosol (SSFA) product containing MODIS aerosols, an ASCII Quality Control (QC) report, and a binary QC file. The output of the Subsystems 4.5 and 4.6 Main Processor PGE CER4.5-6.1P3, which is for Aqua processing, consists of a binary Single Scanner Footprint TOA/Surface Fluxes and Clouds (SSF) product, a binary SSF Aerosol (SSFA) product containing MODIS aerosols, an ASCII Quality Control (QC) report, and a binary QC file.

The HDF Post Processor for CERES Inversion to Instantaneous TOA Fluxes and the Empirical Estimates of Surface Radiation Budget, Subsystems 4.5 and 4.6, reads the binary SSF (and the binary SSFA for Terra and Aqua processing) as input and generates an SSF product in Hierarchical Data Format (HDF).

1.2.2 CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Subset Post Processors

The Subsetting Post Processor PGEs CER4.5-6.2P1 (for TRMM VIRS-only SSF subsetting) and CER4.5-6.2P2, (for Terra and Aqua SSF subsetting) for CERES Inversion to Instantaneous TOA Fluxes and the Empirical Estimates of Surface Radiation Budget, Subsystems 4.5 and 4.6, reads up to 24 hourly binary SSF products as input and generates two SSF daily subset files, the first containing daytime data and the second containing nighttime data. CER4.5-6.2P2 also reads in the hourly Terra or Aqua binary SSFA products as input and subsets the SSFA file into two daytime and nighttime aerosol binary files. The same footprints that were placed on the SSF subset files are selected for the SSF aerosol subset files. PGE CER4.5-6.2P2 also produces daily binary and HDF SSF Nadir products that contain nadir viewing footprints and a daily binary SSF validation product.

1.2.3 CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Alternate Main Processor and HDF Post Processor

The Alternate Main Processor converts CERES unfiltered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint. This processor uses an archived binary SSF as input and only the TOA and surface fluxes are replaced. The output of Subsystems 4.5 and 4.6 Alternate Main Processor consists of a binary Single Scanner Footprint (SSF) product and an SSF product in Hierarchical Data Format (HDF). CER4.5-6.3P1 processes TRMM data and CER4.5-6.3P2 processes Terra data.

1.2.4 CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Monthly Validation Site Post Processor

The Monthly Validation Site Post Processor combines all of the CERES validation site footprint records that were archived in the daily validation site SSF products for a single instrument during a data month and combines them into a single monthly binary SSF file.

2.0 Software and Data File Installation Procedures

This section describes how to install the Subsystems 4.5 and 4.6 Inversion software in preparation for making the necessary test runs at the Langley ASDC. The installation procedures include instructions for uncompressing and untarring the delivered tar files, properly defining environmental variables, and compiling the Inversion programs.

2.1 Installation

Software/Data File Install Procedure:

1. The scripts, makefiles and Process Control Files in the Subsystems 4.5 and 4.6 delivery package expect the CERES environment variable, **\$CERESENV**, to point to a file which sets the following environment variables:

PGSDIR	- Directory for Toolkit libraries
F90	- Pointer to the SGI F90 64 bit compiler
CERESHOME	- Top Directory for CERES Software
CERESLIB	- Directory for CERESlib
PGSMMSG	- Directory which contains Toolkit and CERES Status Message Files
PGSLIB	- Directory which contains SGI 64-bit Toolkit library file
PGSINC	- Pointer to the PGS include file directory
HDFDIR	- Pointer to the HDF home directory
HDFINC	- Pointer to the directory containing the HDF header files
HDFLIB	- Pointer to the directory containing the HDF library

2. Change directory to the directory where you plan to install the Inversion Subsystems. (The following instructions assume that the directory will be **\$CERESHOME**.)
3. Uncompress and untar the tar files by replacing **XXX** with the appropriate SCCR number and typing the following commands:

```
uncompress inversion_src_R4-XXX.tar.Z
tar xf inversion_src_R4-XXX.tar
uncompress inversion_anc_R4-XXX.tar.Z
tar xf inversion_anc_R4-XXX.tar
uncompress inversion_data_R4-XXX.tar.Z
tar xf inversion_data_R4-XXX.tar
```

2.2 Compilation

The instructions for compiling the main processor and HDF post processor and comparison software for PGE CER4.5-6.1P1 are shown in [Section 2.2.1](#), the instructions for compiling the SSF subset post processor and comparison software for PGE CER4.5-6.2P1 are shown in [Section 2.2.2](#), and the instructions for compiling the alternate main processor and HDF post processor and comparison software for PGE CER4.5-6.3P1 are shown in [Section 2.2.3](#). The compilation scripts

contained in each of these sections can be compiled independently, if the software delivery contains only one PGE.

2.2.1 Compiling PGEs CER4.5-6.1P1, CER4.5-6.1P2, and CER4.5-6.1P3

To create the Main and Post Processor executables on directory **\$CERESHOME/inversion/bin/** and to create the comparison software executables on **\$CERESHOME/inversion/test_suites/bin/**, type the following commands:

```
source $CERESENV  
cd $CERESHOME/inversion/bin
```

For TRMM VIRS-only processing, execute the following command:

```
compile_4.5-6.1P1.csh
```

For Terra processing, execute the following command:

```
compile_4.5-6.1P2.csh
```

For Aqua processing, execute the following command:

```
compile_4.5-6.1P3.csh
```

2.2.2 Compiling PGE CER4.5-6.2P1 and PGE CER4.5-6.2P2

To create the SSF Subset Post Processor executable for PGE CER4.5-6.2P1 and the SSF Subset Post Processor and HDF Post Processor for PGE CER4.5-6.2P2 on directory **\$CERESHOME/inversion/bin/** and to create the comparison software executable on **\$CERESHOME/inversion/test_suites/bin/**, type the following commands:

```
source $CERESENV  
cd $CERESHOME/inversion/bin
```

For TRMM VIRS-only processing, execute the following command:

```
compile_4.5-6.2P1.csh
```

For Terra and Aqua processing, execute the following command:

```
compile_4.5-6.2P2.csh
```

2.2.3 Compiling PGE CER4.5-6.3P1

To create the Alternate Main and Post Processor executables on directory **\$CERESHOME/inversion/bin/** and to create the comparison software executables on **\$CERESHOME/inversion/test_suites/bin**, type the following commands:

```
source $CERESENV
cd $CERESHOME/inversion/bin
compile_4.5-6.3P1.csh
```

2.2.4 Compiling PGE CER4.5-6.3P2

To create the Terra Alternate Main and Post Processor executables on directory **\$CERESHOME/inversion/bin/**, type the following commands:

```
source $CERESENV
cd $CERESHOME/inversion/bin
compile_4.5-6.3P2.csh
```

2.2.5 Compiling PGE CER4.5-6.3P3

To create the Aqua Alternate Main and Post Processor executables on directory **\$CERESHOME/inversion/bin/**, type the following commands:

```
source $CERESENV
cd $CERESHOME/inversion/bin
compile_4.5-6.3P3.csh
```

2.2.6 Compiling PGE CER4.5-6.4P1

To create the Alternate Main and Post Processor executables on directory **\$CERESHOME/inversion/bin/** and to create the comparison software executables on **\$CERESHOME/inversion/test_suites/bin**, type the following commands:

```
source $CERESENV
cd $CERESHOME/inversion/bin
compile_4.5-6.4P1.csh
```

3.0 Test and Evaluation Procedures

This section provides general information on how to execute Subsystems 4.5 and 4.6 and provides an overview of the test and evaluation procedures. It includes a description of what is being tested and the order in which the tests should be performed.

3.1 CER4_5-6.1P1 Main and Post Processors for TRMM VIRS-only Processing

3.1.1 Stand Alone Test Procedures

3.1.1.1 PCF Generator

The Main and Post Processor production script, **run_4.5-6.1P1.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. For this test case and production runs, the PCF generator, **pcfgen_4.5-6.1P1.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one 10-digit command-line argument, containing the 4-digit year, 2-digit month, 2-digit day and 2-digit hour of day.

Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_1P1 1998050101
source $CERESHOME/inversion/bin/inversion-test-env.csh
setenv INSTANCE_1P1 $$$4_5\_ $PS4_5\_ $CC4_5\_.$DATE_1P1
setenv INSTANCE_cld $$$4_4\_ $PS4_1\_ $CC4_4\_.$DATE_1P1
$CERESHOME/inversion/bin/pcfgen_4.5-6.1P1.csh $DATE_1P1
```

The following files will be generated:

- **\$CERESHOME/inversion/rcf/CER4.5-6.1P1_PCFin_\$INSTANCE_1P1**
- **\$CERESHOME/inversion/rcf/CER4.5-6.1P1_PCF_\$INSTANCE_1P1**

Copy the input files to appropriate locations:

```
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS2_$$$12.1998050100 $CERESHOME/sarb/data/out_comp/data/
  regridmoa/
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS2_$$$12.1998050106 $CERESHOME/sarb/data/out_comp/data/
  regridmoa/
cp $CERESHOME/inversion/data/input/CER_SSFI_$INSTANCE_cld
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_FQCI_$INSTANCE_cld
  $CERESHOME/clouds/data/out_comp/QA_Reports/
```

3.1.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.1P1.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data.

For the Main and Post Processor test, use \$INSTANCE_1P1, defined in [Section 3.1.1.1](#), and type the following commands to execute the Main and Post Processor Product Generation Executive (PGE), CER4.5-6.1P1:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.1P1.csh $INSTANCE_1P1
```

The script, **list_4.5-6.1P1.csh**, will list the files that were created during execution of the PGE:

```
$CERESHOME/inversion/bin/list_4.5-6.1P1.csh $INSTANCE_1P1
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.1.1.3 Exit Codes

All CER4.5-6.1P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.1.1.4 Test Summary

Test Summary:

Total Run Time:	2:34 minutes
Memory:	203520 K
Required Disk Space:	679 Megabytes

3.1.2 Evaluation Procedures

When running the production script, **run_4.5-6.1P1.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

Remove input data from the clouds directory:

```
rm $CERESHOME/clouds/data/out_comp/data/SSF_Int/
  CER_SSF1_$INSTANCE_cld
rm $CERESHOME/clouds/data/out_comp/QA_Reports/
  CER_FQCI_$INSTANCE_cld
```

If testing of CER4.5-6.3P1 will not be run, then remove MOA input files:

```
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/
  CER_MOA_CERES_ECMWF-GEOS2_$CC12.1998050100
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/
  CER_MOA_CERES_ECMWF-GEOS2_$CC12.1998050106
```

3.1.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.1P1_LogReport_\$INSTANCE_1P1**, is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.1P1 has been executed. Metadata files, which end in extension '.met', are located in the same directories as their corresponding output files after CER4.5-6.1P1 has been executed. Metadata files, **CER_GQCA_\$INSTANCE_1P1.met** and **CER_GQCI_\$INSTANCE_1P1.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/QC**. Metadata files, **CER_SSF1_\$INSTANCE_1P1.met** and **CER_SSF_\$INSTANCE_1P1.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the information contained in the log file with the expected contents of the Log Report file found in directory **\$CERESHOME/inversion/data/out_exp/comp_data** and compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.1P1.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.1P1.csh $INSTANCE_1P1
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.1.2.2 Execution of Comparison Software for the Main Processor

The evaluation software for the Subsystem Main Processor will perform a single test. This test will copy all of the parameters that were written to the binary SSF by PGE CER4.5-6.1P1 into a file and will compare those parameter values to the values in a comparison file provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the binary SSF, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin  
run_compare $INSTANCE_1P1
```

One file will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_1P1**

3.1.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.1P1 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpReport_$DATE_1P1
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

2. File **\$CERESHOME/inversion/test_suites/results/CmpReport_DATE_1P1** will be automatically e-mailed to Sandy Nolan, s.k.nolan@larc.nasa.gov.

3.1.2.4 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```
source $CERESENV  
cd $CERESHOME/inversion/test_suites/bin  
hcmp.exe $CERESHOME/inversion/data/out_comp/data/  
    CER_SSF_$INSTANCE_1P1 $CERESHOME/inversion/data/out_exp/data/  
    CER_SSF_$INSTANCE_1P1
```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE_1P1**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS "....."data... OK.

or

Comparing Vfield "....." data... OK.

The only differences between the two HDF output files should be the dates on Vfields: “SSF_DATE” on the “SSF_Header” Vdata and “CERPRODUCTIONDATETIME” on the “CERES_metadata” Vdata. If CERESLIB has changed, the date may be different in the “LOCALVERSIONID” on the “CERES_metadata” Vdata.

3.1.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.1P1 software. These files must be removed before rerunning these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.1P1.csh**, is located in directory **\$CERESHOME/inversion/bin**. Note: the output from CER4.5-6.1P1 will be used as input for testing PGE CER4.5-6.3P1. To use the clean-up script:

\$CERESHOME/inversion/bin/cleanup_4.5-6.1P1.csh \$INSTANCE_1P1

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.2 CER4_5-6.1P2 Main and Post Processors for Terra Processing

3.2.1 Stand Alone Test Procedures

3.2.1.1 PCF Generator

The Main and Post Processor production script, **run_4.5-6.1P2.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. For this test case and production runs, the PCF generator, **pcfgen_4.5-6.1P2.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one 10-digit command-line argument, containing the 4-digit year, 2-digit month, 2-digit day and 2-digit hour of day.

Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_1P2 2001041001
setenv INSTANCE_1P2 Terra-FM1-MODIS_SSIT_000000.$DATE_1P2
setenv SCC_1P2 Terra-FM1_Test_000024.20010415
source $CERESHOME/inversion/bin/inversion-terra-test-env.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.1P2.csh $DATE_1P2
```

The following files will be generated:

- \$CERESHOME/inversion/rcf/CER4.5-6.1P2_PCFin_\$INSTANCE_1P2
- \$CERESHOME/inversion/rcf/CER4.5-6.1P2_PCF_\$INSTANCE_1P2

Copy the input files to appropriate locations:

```
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS3_015019.2001041000 $CERESHOME/sarb/data/out_comp/data/
  regridmoa/
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS3_015019.2001041006 $CERESHOME/sarb/data/out_comp/data/
  regridmoa/
cp $CERESHOME/inversion/data/input/CER_SSFI_$INSTANCE_1P2
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_SSFAI_$INSTANCE_1P2
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_SSFAI_$INSTANCE_1P2.met
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_FQCI_$INSTANCE_1P2
  $CERESHOME/clouds/data/out_comp/QA_Reports/
cp $CERESHOME/inversion/data/input/CER_SCCD_$SCC_1P2
  $CERESHOME/erbelike/data/ancillary/dynamic/
```



```
cp $CERESHOME/inversion/data/input/CER_SCCN_$SCC_1P2
   $CERESHOME/erbelike/data/ancillary/dynamic/
```

3.2.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.1P2.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data.

For the Main and Post Processor test, use \$INSTANCE_1P2, defined in [Section 3.2.1.1](#), and type the following commands to execute the Main and Post Processor Product Generation Executive (PGE), CER4.5-6.1P2:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.1P2.csh $INSTANCE_1P2
```

The script, **list_4.5-6.1P2.csh**, will list the files that were created during execution of the PGE:

```
$CERESHOME/inversion/bin/list_4.5-6.1P2.csh $INSTANCE_1P2
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.2.1.3 Exit Codes

All CER4.5-6.1P2 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.2.1.4 Test Summary

Test Summary:

Total Run Time:	10:45 minutes
Memory:	278080 K
Required Disk Space:	679 Megabytes

3.2.2 Evaluation Procedures

When running the production script, **run_4.5-6.1P2.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

Remove input data from the clouds directory:

```
rm $CERESHOME/clouds/data/out_comp/data/SSF_Int/
  CER_SSFI_$INSTANCE_1P2
rm $CERESHOME/clouds/data/out_comp/data/SSF_Int/
  CER_SSFAI_$INSTANCE_1P2
rm $CERESHOME/clouds/data/out_comp/QA_Reports/
  CER_FQCI_$INSTANCE_1P2
rm $CERESHOME/erbelike/data/ancillary/dynamic/CER_SCCD_$SCC_1P2
rm $CERESHOME/erbelike/data/ancillary/dynamic/CER_SCCN_$SCC_1P2
```

If testing of CER4.5-6.3P1 will not be run, then remove MOA input files:

```
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/
  CER_MOA_CERES_ECMWF-GEOS3_015019.2001041000
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/
  CER_MOA_CERES_ECMWF-GEOS3_015019.2001041006
```

3.2.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.1P2_LogReport_\$INSTANCE_1P2**, is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.1P2 has been executed. Metadata files, which end in extension '.met', are located in the same directories as their corresponding output files after CER4.5-6.1P2 has been executed. Metadata files, **CER_GQCA_\$INSTANCE_1P2.met** and **CER_GQCI_\$INSTANCE_1P2.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/QC**. Metadata files, **CER_SSFB_\$INSTANCE_1P2.met** and **CER_SSF_\$INSTANCE_1P2.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the information contained in the log file with the expected contents of the Log Report file found in directory **\$CERESHOME/inversion/data/out_exp/comp_data** and compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.1P2.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.1P2.csh $INSTANCE_1P2
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.2.2.2 Execution of Comparison Software for the Main Processor

The evaluation software for the Subsystem Main Processor will perform a single test. This test will compare all of the parameters on the binary SSF and the binary SSFA (if it exists) to the values in comparison files provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the binary SSF and binary SSFA, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin  
run_compare_p2 $INSTANCE_1P2
```

Two files will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_1P2**
- **\$CERESHOME/inversion/test_suites/results/CmpReportSSFA_\$DATE_1P2**

3.2.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.1P2 comparison software.

1. Examine the comparison reports files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpReport_$DATE_1P2  
cat $CERESHOME/inversion/test_suites/results/CmpReportSSFA_$DATE_1P2
```

The final line of these files will report the status of the comparison between the generated data and the expected output.

2. File **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_1P2** will be automatically e-mailed to Sandy Nolan, s.k.nolan@larc.nasa.gov.

3.2.2.4 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```

source $CERESENV
cd $CERESHOME/inversion/test_suites/bin
hcmp.exe $CERESHOME/inversion/data/out_comp/data/
CER_SSF_$INSTANCE_1P2 $CERESHOME/inversion/data/out_exp/data/
CER_SSF_$INSTANCE_1P2

```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE_1P2**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS "....." data... OK.

or

Comparing Vfield "....." data... OK.

The only differences between the two HDF output files should be the dates on Vfields: "SSF_DATE" on the "SSF_Header" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata.

3.2.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.1P2 software. These files must be removed before rerunning these test procedures. A script which removes PGE created files, **cleanup_4.5-6.1P2.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

```
$CERESHOME/inversion/bin/cleanup_4.5-6.1P2.csh $INSTANCE_1P2
```

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.3 CER4_5-6.1P3 Main and Post Processors for Aqua Processing

3.3.1 Stand Alone Test Procedures

3.3.1.1 PCF Generator

The Main and Post Processor production script, **run_4.5-6.1P3.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. For this test case and production runs, the PCF generator, **pcfgen_4.5-6.1P3.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one 10-digit command-line argument, containing the 4-digit year, 2-digit month, 2-digit day and 2-digit hour of day.

Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_1P3 2001041001
setenv INSTANCE_1P3 Aqua-FM3-MODIS_SSIT_000000.$DATE_1P3
source $CERESHOME/inversion/bin/inversion-aqua-test-env.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.1P3.csh $DATE_1P3
```

The following files will be generated:

- **\$CERESHOME/inversion/rcf/CER4.5-6.1P3_PCFin_\$INSTANCE_1P3**
- **\$CERESHOME/inversion/rcf/CER4.5-6.1P3_PCF_\$INSTANCE_1P3**

Copy the input files to appropriate locations:

```
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS3_015019.2001041000 $CERESHOME/sarb/data/out_comp/data/
  regridmoa/
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS3_015019.2001041006 $CERESHOME/sarb/data/out_comp/data/
  regridmoa/
cp $CERESHOME/inversion/data/input/CER_SSFI_$INSTANCE_1P3
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_SSFAI_$INSTANCE_1P3
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_SSFAI_$INSTANCE_1P3.met
  $CERESHOME/clouds/data/out_comp/data/SSF_Int/
cp $CERESHOME/inversion/data/input/CER_FQCI_$INSTANCE_1P3
  $CERESHOME/clouds/data/out_comp/QA_Reports/
```

3.3.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.1P3.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data.

For the Main and Post Processor test, use \$INSTANCE_1P3, defined in [Section 3.3.1.1](#), and type the following commands to execute the Main and Post Processor Product Generation Executive (PGE), CER4.5-6.1P3:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.1P3.csh $INSTANCE_1P3
```

The script, **list_4.5-6.1P3.csh**, will list the files that were created during execution of the PGE:

```
$CERESHOME/inversion/bin/list_4.5-6.1P3.csh $INSTANCE_1P3
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.3.1.3 Exit Codes

All CER4.5-6.1P3 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.3.1.4 Test Summary

Test Summary:

Total Run Time:	15:18 minutes
Memory:	278096 K
Required Disk Space:	679 Megabytes

3.3.2 Evaluation Procedures

When running the production script, **run_4.5-6.1P3.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

Remove input data from the clouds directory:

```
rm $CERESHOME/clouds/data/out_comp/data/SSF_Int/  
CER_SSFI_$INSTANCE_1P3  
rm $CERESHOME/clouds/data/out_comp/data/SSF_Int/  
CER_SSFAI_$INSTANCE_1P3  
rm $CERESHOME/clouds/data/out_comp/QA_Reports/  
CER_FQCI_$INSTANCE_1P3
```

If testing of CER4.5-6.3P1 will not be run, then remove MOA input files:

```
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/  
CER_MOA_CERES_ECMWF-GEOS3_015019.2001041000  
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/  
CER_MOA_CERES_ECMWF-GEOS3_015019.2001041006
```

3.3.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.1P3_LogReport_\$INSTANCE_1P3**, is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.1P3 has been executed. Metadata files, which end in extension '.met', are located in the same directories as their corresponding output files after CER4.5-6.1P3 has been executed. Metadata files, **CER_GQCA_\$INSTANCE_1P3.met** and **CER_GQCI_\$INSTANCE_1P3.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/QC**. Metadata files, **CER_SSFB_\$INSTANCE_1P3.met** and **CER_SSF_\$INSTANCE_1P3.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the information contained in the log file with the expected contents of the Log Report file found in directory **\$CERESHOME/inversion/data/out_exp/comp_data** and compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.1P3.csh** script:

```
cd $CERESHOME/inversion/bin  
$CERESHOME/inversion/bin/diff_4.5-6.1P3.csh $INSTANCE_1P3
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.3.2.2 Execution of Comparison Software for the Main Processor

The evaluation software for the Subsystem Main Processor will perform a single test. This test will compare all of the parameters on the binary SSF and the binary SSFA (if it exists) to the values in comparison files provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the binary SSF and binary SSFA, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin  
run_compare_p2 $INSTANCE_1P3
```

Two files will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_1P3**
- **\$CERESHOME/inversion/test_suites/results/CmpReportSSFA_\$DATE_1P3**

3.3.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.1P3 comparison software.

1. Examine the comparison reports files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpReport_$DATE_1P3  
cat $CERESHOME/inversion/test_suites/results/CmpReportSSFA_$DATE_1P3
```

The final line of these files will report the status of the comparison between the generated data and the expected output.

2. File **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_1P3** will be automatically e-mailed to Sandy Nolan, s.k.nolan@larc.nasa.gov.

3.3.2.4 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```
source $CERESENV  
cd $CERESHOME/inversion/test_suites/bin  
hcmp.exe $CERESHOME/inversion/data/out_comp/data/  
    CER_SSF_$INSTANCE_1P3 $CERESHOME/inversion/data/out_exp/data/  
    CER_SSF_$INSTANCE_1P3
```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE_1P3**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS “.....” data... OK.

or

Comparing Vfield “.....” data... OK.

The only differences between the two HDF output files should be the dates on Vfields: “SSF_DATE” on the “SSF_Header” Vdata and “CERPRODUCTIONDATETIME” on the “CERES_metadata” Vdata. If CERESLIB has changed, the date may be different in the “LOCALVERSIONID” on the “CERES_metadata” Vdata.

3.3.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.1P3 software. These files must be removed before rerunning these test procedures. A script which removes PGE created files, **cleanup_4.5-6.1P3.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

\$CERESHOME/inversion/bin/cleanup_4.5-6.1P3.csh \$INSTANCE_1P3

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.4 CER4_5-6.2P1 Daily SSF Subset Post Processor for TRMM VIRS-only SSF Subsetting

3.4.1 Stand Alone Test Procedures

3.4.1.1 PCF Generator

The SSF subset processor production script, **run_4.5-6.2P1.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF generator, **pcfgen_4.5-6.2P1.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one command-line argument, YYYYMMDD, which consists of a, 4-digit year, 2-digit month, and 2-digit day.

1. Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_2P1 20000225
setenv INSTANCE_2P1 TRMM-PFM-VIRS_SSIT_000001.$DATE_2P1
source $CERESHOME/inversion/bin/inversion-test-subset-env.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.2P1.csh $DATE_2P1
```

The following files will be generated:

- \$CERESHOME/inversion/rcf/CER4.5-6.2P1_PCFin_\$INSTANCE_2P1
- \$CERESHOME/inversion/rcf/CER4.5-6.2P1_PCF_\$INSTANCE_2P1

3.4.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.2P1.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDD, where YYYY is the 4-digit year, MM is the 2-digit month, and DD is the 2-digit day of the data.

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.2P1.csh $INSTANCE_2P1
```

The SSF subset Processor Product Generation Executive (PGE), CER4.5-6.2P1, will be executed and will create the files printed out by the **list_4.5-6.2P1.csh** script:

```
$CERESHOME/inversion/bin/list_4.5-6.2P1.csh $INSTANCE_2P1
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.4.1.3 Exit Codes

All CER4.5-6.2P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.4.1.4 Test Summary

SSF Subset Postprocessor Test Summary:

Total Run Time:	1:30 minutes
Memory:	5952 K
Required Disk Space:	200 Megabytes

3.4.2 Evaluation Procedures

When running the production script, **run_4.5-6.2P1.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

3.4.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.2P1_LogReport_\$INSTANCE_2P1** is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.2P1 has been executed. Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER4.5-6.2P1 has been executed. Metadata files, **CER_SSFS-DAY_\$INSTANCE_2P1.met** and **CER_SSFS-NIT_\$INSTANCE_2P1.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**. Compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.2P1.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.2P1.csh $INSTANCE_2P1
```

The only differences between the *.met files should be the production times and differences in the directory paths where the tests were run.

3.4.2.2 Execution of Comparison Software for the SSF Subset Post Processor

The evaluation software for this SSF Subset Post Processor will perform a single test. This test will compare the data on the two newly created SSF subset files to the comparison files provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the CER4.5-6.2P1, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin  
run_subset_compare $INSTANCE_2P1
```

A comparison output file will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpSubset_\$DATE_2P1**

3.4.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.2P1 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpSubset_$DATE_2P1
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

3.4.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.2P1 software. These files must be removed before running these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.2P1.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

```
$CERESHOME/inversion/bin/cleanup_4.5-6.2P1.csh $INSTANCE_2P1
```

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.5 CER4_5-6.2P2 Terra SSF Subsetting Post Processor producing Daily SSF and SSFA subset files, and Nadir SSF, Validation SSF, and Validation SSFA products

3.5.1 Stand Alone Test Procedures

3.5.1.1 PCF Generator

The SSF subset processor production script, **run_4.5-6.2P2.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF generator, **pcfgen_4.5-6.2P2.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one command-line argument, YYYYMMDD, which consists of a, 4-digit year, 2-digit month, and 2-digit day.

1. Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_2P2 20010103
setenv INSTANCE_2P2 Terra-FM1-MODIS_SSIT_000001.$DATE_2P2
source $CERESHOME/inversion/bin/inversion-terra-test-subset-env.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.2P2.csh $DATE_2P2
```

The following files will be generated:

- \$CERESHOME/inversion/rcf/CER4.5-6.2P2_PCFin_\$INSTANCE_2P2
- \$CERESHOME/inversion/rcf/CER4.5-6.2P2_PCF_\$INSTANCE_2P2

3.5.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.2P2.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDD, where YYYY is the 4-digit year, MM is the 2-digit month, and DD is the 2-digit day of the data.

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.2P2.csh $INSTANCE_2P2
```

The SSF subset Processor Product Generation Executive (PGE), CER4.5-6.2P2, will be executed and will create the files printed out by the **list_4.5-6.2P2.csh** script:

```
$CERESHOME/inversion/bin/list_4.5-6.2P2.csh $INSTANCE_2P2
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.5.1.3 Exit Codes

All CER4.5-6.2P2 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.5.1.4 Test Summary

SSF Subset Postprocessor Test Summary:

Total Run Time:	5:30 minutes
Memory:	36688 K
Required Disk Space:	200 Megabytes

3.5.2 Evaluation Procedures

When running the production script, **run_4.5-6.2P2.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

3.5.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.2P2_LogReport_\$INSTANCE_2P2** is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.2P2 has been executed. Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER4.5-6.2P2 has been executed.

Metadata files:

- **CER_SSFS-DAY_\$INSTANCE_2P2.met**
- **CER_SSFS-NIT_\$INSTANCE_2P2.met**
- **CER_SSFA-DAY_\$INSTANCE_2P2.met**
- **CER_SSFB-nadir_\$INSTANCE_2P2.met**
- **CER_SSFB-val_\$INSTANCE_2P2.met**
- **CER_SSFA-val_\$INSTANCE_2P2.met**

are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.2P2.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.2P2.csh $INSTANCE_2P2
```

The only differences between the *.met files should be the production times and differences in the directory paths where the tests were run.

3.5.2.2 Execution of Comparison Software for the SSF Subset Post Processor

The evaluation software for this SSF Subset Post Processor will perform a single test. This test will compare the data on the two newly created SSF subset files to the comparison files provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the CER4.5-6.2P2, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin
run_subset_compare $INSTANCE_2P2
run_subset_aerosol_compare $INSTANCE_2P2
run_nadir_compare $INSTANCE_2P2
run_validation_compare $INSTANCE_2P2
run_validation_aero_compare $INSTANCE_2P2
```

The following comparison output files will be created:

- \$CERESHOME/inversion/test_suites/results/CmpSubset_\$DATE_2P2
- \$CERESHOME/inversion/test_suites/results/CmpSubsetSSF2A_\$DATE_2P2
- \$CERESHOME/inversion/test_suites/results/
CmpSubsetSSFNadir_\$DATE_2P2
- \$CERESHOME/inversion/test_suites/results/CmpSubsetSSFVal_\$DATE_2P2
- \$CERESHOME/inversion/test_suites/results/
CmpSubsetSSFAVal_\$DATE_2P2

3.5.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.2P2 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpSubset_$DATE_2P2
cat $CERESHOME/inversion/test_suites/results/  
CmpSubsetSSF2A_$DATE_2P2
cat $CERESHOME/inversion/test_suites/results/  
CmpSubsetSSFNadir_$DATE_2P2
cat $CERESHOME/inversion/test_suites/results/  
CmpSubsetSSFVal_$DATE_2P2
cat $CERESHOME/inversion/test_suites/results/  
CmpSubsetSSFAVal_$DATE_2P2
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

3.5.2.4 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```
source $CERESENV
cd $CERESHOME/inversion/test_suites/bin
hcmp.exe $CERESHOME/inversion/data/out_comp/data/CER_SSF-
nadir_$INSTANCE_2P2 $CERESHOME/inversion/data/out_exp/data/
CER_SSF-nadir_$INSTANCE_2P2
```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE_2P2**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS "....." data... OK.

or

Comparing Vfield "....." data... OK.

The only differences between the two HDF output files should be the dates on Vfields: "SSF_DATE" on the "SSF_Header" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata.

3.5.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.2P2 software. These files must be removed before running these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.2P2.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

```
$CERESHOME/inversion/bin/cleanup_4.5-6.2P2.csh $INSTANCE_2P2
```

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.6 CER4_5-6.3P1 Alternate Main and Post Processors

3.6.1 Stand Alone Test Procedures

3.6.1.1 PCF Generator

The Main and Post Processor production script, **run_4.5-6.3P1.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. For this test and production runs, the PCF generator, **pcfgen_4.5-6.3P1.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one 10-digit command-line argument, containing the 4-digit year, 2-digit month, 2-digit day and 2-digit hour of day.

Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_3P1 1998050101
setenv INSTANCE3 TRMM-PFM-VIRS_SSIT2_000001.$DATE_3P1
source $CERESHOME/inversion/bin/inversion-test3-env.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.3P1.csh $DATE_3P1
```

The following files will be generated:

- **\$CERESHOME/inversion/rcf/CER4.5-6.3P1_PCFin_\$INSTANCE3**
- **\$CERESHOME/inversion/rcf/CER4.5-6.3P1_PCF_\$INSTANCE3**

If PGE CER4.5-6.1P1 was not tested, then copy the following input data files:

```
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS2_010012.1998050100 $CERESHOME/sarb/data/out_comp/data/
  regridmoa
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS2_010012.1998050106 $CERESHOME/sarb/data/out_comp/data/
  regridmoa
```

3.6.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.3P1.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy' _ 'Production Strategy' _ 'Configuration Code' . 'Data Date'. The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data.

For the Main and Post Processor test, use \$INSTANCE3, defined in [Section 3.6.1.1](#), and type the following commands to execute the Alternate Main and Post Processor Product Generation Executive (PGE), CER4.5-6.3P1:

```
cd $CERESHOME/inversion/bin  
$CERESHOME/inversion/bin/run_4.5-6.3P1.csh $INSTANCE3
```

The script, **list_4.5-6.3P1.csh**, will list the files that were created during execution of the PGE:

```
$CERESHOME/inversion/bin/list_4.5-6.3P1.csh $INSTANCE3
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.6.1.3 Exit Codes

All CER4.5-6.3P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.6.1.4 Test Summary

Test Summary:

Total Run Time:	5:05 minutes
Memory:	208496 K
Required Disk Space:	500 Megabytes

3.6.2 Evaluation Procedures

When running the production script, **run_4.5-6.3P1.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

Remove MOA input files from the sarb directory:

```
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/  
CER_MOA_CERES_ECMWF-GEOS2_010012.1998050100  
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/  
CER_MOA_CERES_ECMWF-GEOS2_010012.1998050106
```

3.6.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.3P1_LogReport_\$INSTANCE3**, is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.3P1 has been executed. Metadata files, which end in extension '.met', are located in the same directories as their corresponding output files after CER4.5-6.3P1 has been executed. Metadata files, **CER_SSFB_\$INSTANCE3.met** and **CER_SSF_\$INSTANCE3.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the information contained in the log file with the expected contents of the Log Report file found in directory **\$CERESHOME/inversion/data/out_exp/comp_data** and compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.3P1.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.3P1.csh $INSTANCE3
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.6.2.2 Execution of Comparison Software for the Main Processor

The evaluation software for the Subsystem Main Processor will perform a single test. This test will copy all of the parameters that were written to the binary SSF by PGE CER4.5-6.3P1 into a file and will compare those parameter values to the values in a comparison file provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the binary SSF, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin
run_compare3 $INSTANCE3
```

One file will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpReport3_\$DATE_3P1**

3.6.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.1P1 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpReport3_$DATE_3P1
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

2. File **\$CERESHOME/inversion/test_suites/results/CmpReport3_\$DATE_3P1** will be automatically e-mailed to Sandy Nolan, s.k.nolan@larc.nasa.gov.

3.6.2.4 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```
source $CERESENV
cd $CERESHOME/inversion/test_suites/bin
hcmp.exe $CERESHOME/inversion/data/out_comp/data/CER_SSF_$INSTANCE3
        $CERESHOME/inversion/data/out_exp/data/CER_SSF_$INSTANCE3
```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE3**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS "....." data... OK.
or
Comparing Vfield "....." data... OK.

The only differences between the two HDF output files should be the dates on Vfields: "SSF_DATE" on the "SSF_Header" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata.

3.6.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.3P1 software. These files must be removed before rerunning these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.3P1.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

```
$CERESHOME/inversion/bin/cleanup_4.5-6.3P1.csh $INSTANCE3
```

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.7 CER4_5-6.3P2 Alternate Main and Post Processors for Terra

3.7.1 Stand Alone Test Procedures

3.7.1.1 PCF Generator

The Main and Post Processor production script, **run_4.5-6.3P2.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. For this test and production runs, the PCF generator, **pcfgen_4.5-6.3P2.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one 10-digit command-line argument, containing the 4-digit year, 2-digit month, 2-digit day and 2-digit hour of day.

Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_3P2 2000030100
setenv INSTANCE3 Terra-FM1-MODIS_SSIT_000000.$DATE_3P2
source $CERESHOME/inversion/bin/inversion-terra-test-env-3p2.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.3P2.csh $DATE_3P2
```

The following files will be generated:

- \$CERESHOME/inversion/rcf/CER4.5-6.3P2_PCFin_\$INSTANCE3
- \$CERESHOME/inversion/rcf/CER4.5-6.3P2_PCF_\$INSTANCE3

Copy the following input data files:.

```
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_DAO-
  GEOS4_016023.2000030100 $CERESHOME/sarb/data/out_comp/data/
  regridmoa
```

3.7.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.3P2.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data.

For the Main and Post Processor test, use \$INSTANCE3, defined in [Section 3.7.1.1](#), and type the following commands to execute the Alternate Main and Post Processor Product Generation Executive (PGE), CER4.5-6.3P2:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.3P2.csh $INSTANCE3
```

The script, **list_4.5-6.3P2.csh**, will list the files that were created during execution of the PGE:

```
$CERESHOME/inversion/bin/list_4.5-6.3P2.csh $INSTANCE3
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.7.1.3 Exit Codes

All CER4.5-6.3P2 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.7.1.4 Test Summary

Test Summary:

Total Run Time:	3:05 minutes
Memory:	208496 K
Required Disk Space:	500 Megabytes

3.7.2 Evaluation Procedures

When running the production script, **run_4.5-6.3P2.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

Remove MOA input files from the sarb directory:

```
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/
CER_MOA_CERES_DAO-GEOS4_016023.2000030100
```

3.7.3 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.3P2_LogReport_\$INSTANCE3**, is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.3P1 has been executed. Metadata files, which end in extension '.met', are located in the same directories as their corresponding output files after CER4.5-6.3P1 has been executed. Metadata files, **CER_SSFB_\$INSTANCE3.met**, **CER_SSFA_\$INSTANCE3.met**, and **CER_SSF_\$INSTANCE3.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the information contained in the log file with the expected contents of the Log Report file found in directory **\$CERESHOME/inversion/data/out_exp/comp_data** and compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.3P2.csh** script:

```
cd $CERESHOME/inversion/bin  
$CERESHOME/inversion/bin/diff_4.5-6.3P2.csh $INSTANCE3
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.7.3.1 Execution of Comparison Software for the Main Processor

The evaluation software for this Processor will perform a single test.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the binary SSF and SSFA, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin  
run_compare_p2 $INSTANCE3
```

Two files will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_3P2**
- **\$CERESHOME/inversion/test_suites/results/CmpReportSSFA_\$DATE_3P2**

Note: The message that **CER_GQCA_*** files cannot be found can be ignored.

3.7.3.2 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.3P2 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpReport_$DATE_3P2  
cat $CERESHOME/inversion/test_suites/results/CmpReportSSFA_$DATE_3P2
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

2. File **\$CERESHOME/inversion/test_suites/results/CmpReport3_\$DATE_3P2** will be automatically e-mailed to Sandy Nolan, s.k.nolan@larc.nasa.gov.

3.7.3.3 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```
source $CERESENV
cd $CERESHOME/inversion/test_suites/bin
hcmp.exe $CERESHOME/inversion/data/out_comp/data/CER_SSF_$INSTANCE3
        $CERESHOME/inversion/data/out_exp/data/CER_SSF_$INSTANCE3
```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE3**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS "....." data... OK.
or
Comparing Vfield "....." data... OK.

The only differences between the two HDF output files should be the dates on Vfields: "SSF_DATE" on the "SSF_Header" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata.

3.7.4 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.3P2 software. These files must be removed before rerunning these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.3P2.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

```
$CERESHOME/inversion/bin/cleanup_4.5-6.3P2.csh $INSTANCE3
```

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.8 CER4_5-6.3P3 Alternate Main and Post Processors for Aqua

3.8.1 Stand Alone Test Procedures

3.8.1.1 PCF Generator

The Main and Post Processor production script, **run_4.5-6.3P3.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. For this test and production runs, the PCF generator, **pcfgen_4.5-6.3P3.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one 10-digit command-line argument, containing the 4-digit year, 2-digit month, 2-digit day and 2-digit hour of day.

Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_3P3 2002090100
setenv INSTANCE3 Aqua-FM4-MODIS_SSIT_000000.$DATE_3P3
source $CERESHOME/inversion/bin/inversion-terra-test-env-3p3.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.3P3.csh $DATE_3P3
```

The following files will be generated:

- **\$CERESHOME/inversion/rcf/CER4.5-6.3P3_PCFin_\$INSTANCE3**
- **\$CERESHOME/inversion/rcf/CER4.5-6.3P3_PCF_\$INSTANCE3**

Copy the following input data files:.

```
cp $CERESHOME/inversion/data/input/CER_MOA_CERES_ECMWF-
  GEOS3_016020.2002090100 $CERESHOME/sarb/data/out_comp/data/
  regridmoa
```

3.8.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.3P3.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data.

For the Main and Post Processor test, use \$INSTANCE3, defined in [Section 3.8.1.1](#), and type the following commands to execute the Alternate Main and Post Processor Product Generation Executive (PGE), CER4.5-6.3P3:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.3P3.csh $INSTANCE3
```

The script, **list_4.5-6.3P3.csh**, will list the files that were created during execution of the PGE:

```
$CERESHOME/inversion/bin/list_4.5-6.3P3.csh $INSTANCE3
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.8.1.3 Exit Codes

All CER4.5-6.3P3 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.8.1.4 Test Summary

Test Summary:

Total Run Time:	3:05 minutes
Memory:	208496 K
Required Disk Space:	500 Megabytes

3.8.2 Evaluation Procedures

When running the production script, **run_4.5-6.3P3.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

Remove MOA input files from the sarb directory:

```
rm $CERESHOME/sarb/data/out_comp/data/regridmoa/
CER_MOA_CERES_ECMWF-GEOS3_016020.2002090100
```

3.8.3 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.3P3_LogReport_\$INSTANCE3**, is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.3P3 has been executed. Metadata files, which end in extension '.met', are located in the same directories as their corresponding output files after CER4.5-6.3P3 has been executed. Metadata files, **CER_SSFB_\$INSTANCE3.met**, **CER_SSFA_\$INSTANCE3.met**, and **CER_SSF_\$INSTANCE3.met**, are written to directory, **\$CERESHOME/inversion/data/out_comp/data**.

Compare the information contained in the log file with the expected contents of the Log Report file found in directory **\$CERESHOME/inversion/data/out_exp/comp_data** and compare the metadata files with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.3P3.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.3P3.csh $INSTANCE3
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.8.3.1 Execution of Comparison Software for the Main Processor

The evaluation software for this Processor will perform a single test.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the binary SSF and SSFA, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin
run_compare_p2 $INSTANCE3
```

Two files will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpReport_\$DATE_3P3**
- **\$CERESHOME/inversion/test_suites/results/CmpReportSSFA_\$DATE_3P3**

Note: The message that **CER_GQCA_*** files cannot be found can be ignored.

3.8.3.2 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.3P2 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/CmpReport_$DATE_3P3
cat $CERESHOME/inversion/test_suites/results/CmpReportSSFA_$DATE_3P3
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

2. File **\$CERESHOME/inversion/test_suites/results/CmpReport3_\$DATE_3P3** will be automatically e-mailed to Sandy Nolan, s.k.nolan@larc.nasa.gov.

3.8.3.3 Evaluation of SSF HDF Product

This section provides the procedure for evaluating the output from the SSF HDF product produced by the test software. The comparison software was compiled when all software was compiled in a previous step. Execute the program by typing the following lines:

```
source $CERESENV
cd $CERESHOME/inversion/test_suites/bin
hcmp.exe $CERESHOME/inversion/data/out_comp/data/CER_SSF_$INSTANCE3
        $CERESHOME/inversion/data/out_exp/data/CER_SSF_$INSTANCE3
```

The executable, **hcmp.exe**, compares each Vdata and each SDS on the SSF HDF output file. If the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/inversion/data/out_comp/data/CER_SSF_\$INSTANCE3**, matches the data on the provided SSF HDF file of the same name on **\$CERESHOME/inversion/data/out_exp/data**, 'OK.' is appended to the end of the output line as follows:

Comparing SDS "....." data... OK.
or
Comparing Vfield "....." data... OK.

The only differences between the two HDF output files should be the dates on Vfields: "SSF_DATE" on the "SSF_Header" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata.

3.8.4 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.3P3 software. These files must be removed before rerunning these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.3P3.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

```
$CERESHOME/inversion/bin/cleanup_4.5-6.3P3.csh $INSTANCE3
```

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

3.9 CER4_5-6.4P1 Terra SSF Post Processor producing Monthly SSF and SSFA Validation subset files.

3.9.1 Stand Alone Test Procedures

3.9.1.1 PCF Generator

The SSF processor production script, **run_4.5-6.4P1.csh**, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF generator, **pcfgen_4.5-6.4P1.csh**, must be executed to create the ASCII input file and PCF for a particular production run. The PCF generator requires one command-line argument, YYYYMM, which consists of a, 4-digit year, and 2-digit month.

1. Generate the PCF for the test case:

```
cd $CERESHOME/inversion/bin
setenv DATE_4P1 200011
setenv INSTANCE_4P1 Terra-FM1-MODIS_Edition1A_020021.$DATE_4P1
source $CERESHOME/inversion/bin/inversion-terra-valmm-subset.csh
$CERESHOME/inversion/bin/pcfgen_4.5-6.4P1.csh $DATE_4P1
```

The following files will be generated:

- \$CERESHOME/inversion/rcf/CER4.5-6.4P1_PCFin_\$INSTANCE_4P1
- \$CERESHOME/inversion/rcf/CER4.5-6.4P1_PCF_\$INSTANCE_4P1

3.9.1.2 Execution

Execute the production script by typing the script name, **run_4.5-6.4P1.csh**, followed by a string which designates the instance of the product. The string should be formatted, 'Sampling Strategy'_'Production Strategy'_'Configuration Code'_'Data Date'. The date parameter is formatted, YYYYMM, where YYYY is the 4-digit year, MM is the 2-digit month of the data.

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/run_4.5-6.4P1.csh $INSTANCE_4P1
```

The SSF Processor Product Generation Executive (PGE), CER4.5-6.4P1, will be executed and will create the files printed out by the **list_4.5-6.4P1.csh** script:

```
$CERESHOME/inversion/bin/list_4.5-6.4P1.csh $INSTANCE_4P1
```

Note: If any file that should have been created is missing, then a message is written to the screen naming which file could not be found.

3.9.1.3 Exit Codes

All CER4.5-6.4P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.9.1.4 Test Summary

SSF Subset Postprocessor Test Summary:

Total Run Time:	8:00 minutes
Memory:	2672 K
Required Disk Space:	1150 Megabytes

3.9.2 Evaluation Procedures

When running the production script, **run_4.5-6.4P1.csh**, the system message, 'No match', may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

3.9.2.1 Log and Status File Results and Metadata Evaluation

The Error and Status Log File, **CER4.5-6.4P1_LogReport_\$INSTANCE_4P1** is located in directory **\$CERESHOME/inversion/data/runlogs** after CER4.5-6.4P1 has been executed. Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER4.5-6.4P1 has been executed.

Metadata files:

CER_SSFB-valmm_\$INSTANCE_4P1.met
CER_SSFA-valmm_\$INSTANCE_4P1.met

are written to directory, **\$CERESHOME/inversion/data/out_comp/data**

For the quality control output, metadata file **CER_GQCA-val_\$INSTANCE_4P1.met** is written to directory, **\$CERESHOME/inversion/data/out_comp/QC**

Compare the metadata files and the quality control report with the expected contents of the files with the same names found in directory **\$CERESHOME/inversion/data/out_exp/comp_data**, using the following **diff_4.5-6.4P1.csh** script:

```
cd $CERESHOME/inversion/bin
$CERESHOME/inversion/bin/diff_4.5-6.4P1.csh $INSTANCE_4P1
```

The only differences between the *.met files should be the production times and differences in the directory paths where the tests were run. The only differences between the quality control files should be the production date.

3.9.2.2 Execution of Comparison Software for the SSF Monthly Post Processor

The evaluation software for this SSF Post Processor will perform a single test. This test will compare the data on the two newly created monthly validation site SSF files to the comparison files provided with the software delivery.

1. The executable for the comparison software is not provided in the tar file. It was created when all the software's code was compiled.
2. To execute the comparison software for the CER4.5-6.4P1, type the following commands:

```
cd $CERESHOME/inversion/test_suites/bin  
run_valmm_compare $INSTANCE_4P1  
run_valmm_a_compare $INSTANCE_4P1
```

The following comparison output files will be created:

- **\$CERESHOME/inversion/test_suites/results/CmpSubsetSSFValmm_\$DATE_4P1**
- **\$CERESHOME/inversion/test_suites/results/CmpSubsetSSFValmm_\$DATE_4P1**

3.9.2.3 Evaluation of Comparison Software Output

This section provides the procedure for evaluating the output from the CER4.5-6.4P1 comparison software.

1. Examine the comparison report files by typing:

```
cat $CERESHOME/inversion/test_suites/results/  
CmpSubsetSSFValmm_$DATE_4P1  
cat $CERESHOME/inversion/test_suites/results/  
CmpSubsetSSFValmm_$DATE_4P1
```

The final line of this file will report the status of the comparison between the generated data and the expected output.

3.9.3 Solutions to Possible Problems

1. All output files are opened with Status = NEW in the CER4.5-6.4P1 software. These files must be removed before running these test procedures. A script, which removes PGE created files, **cleanup_4.5-6.4P1.csh**, is located in directory **\$CERESHOME/inversion/bin**. To use the clean-up script:

\$CERESHOME/inversion/bin/cleanup_4.5-6.4P1.csh \$INSTANCE_4P1

2. Use the latest version of CERESlib.
3. Ignore the warnings received during compilation.

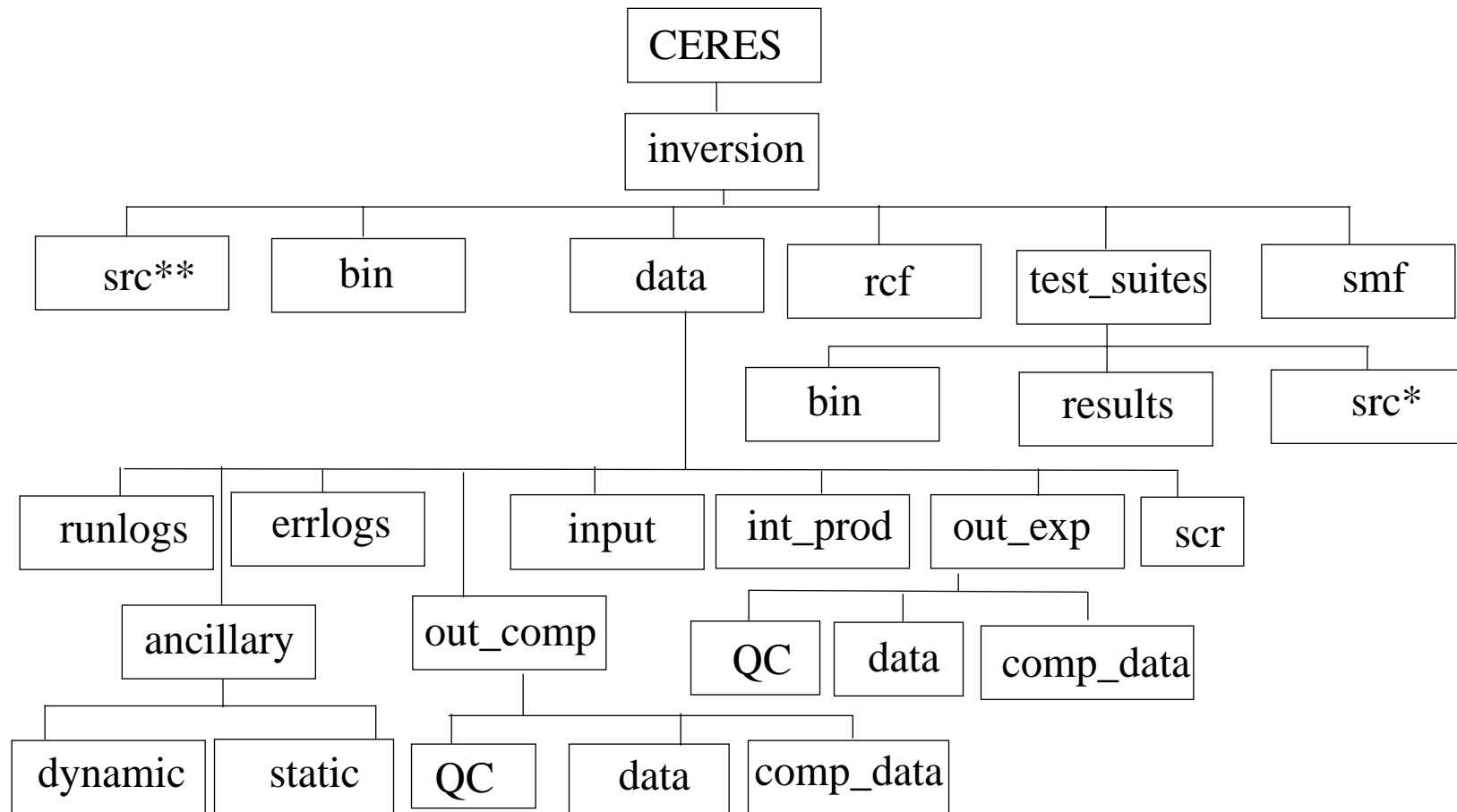
Appendix A

Acronyms and Abbreviations

ASCII	American Standard Code Information Interchange
ASDC	Atmospheric Sciences Data Center
CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
DAAC	Distributed Active Archive Center
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
F90	Fortran 90
HDF	Hierarchical Data Format
LaTIS	Langley TRMM Information System
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PGE	Product Generation Executives
QC	Quality Control
SSF	Single Scanner Footprint TOA/Surface Fluxes and Clouds
SSF	Single Scanner Footprint TOA/Surface Fluxes and Clouds
SSFA	Single Scanner Footprint TOA/Surface Fluxes and Clouds Aerosols
TOA	Top-of-Atmosphere
TRMM	Tropical Rainfall Measuring Mission

Appendix B Directory Structure Diagram

Directory Structure for the Inversion Tar File



*Continued on next page

Figure B-1. Directory Structure for the Inversion Tar File (1 of 2)

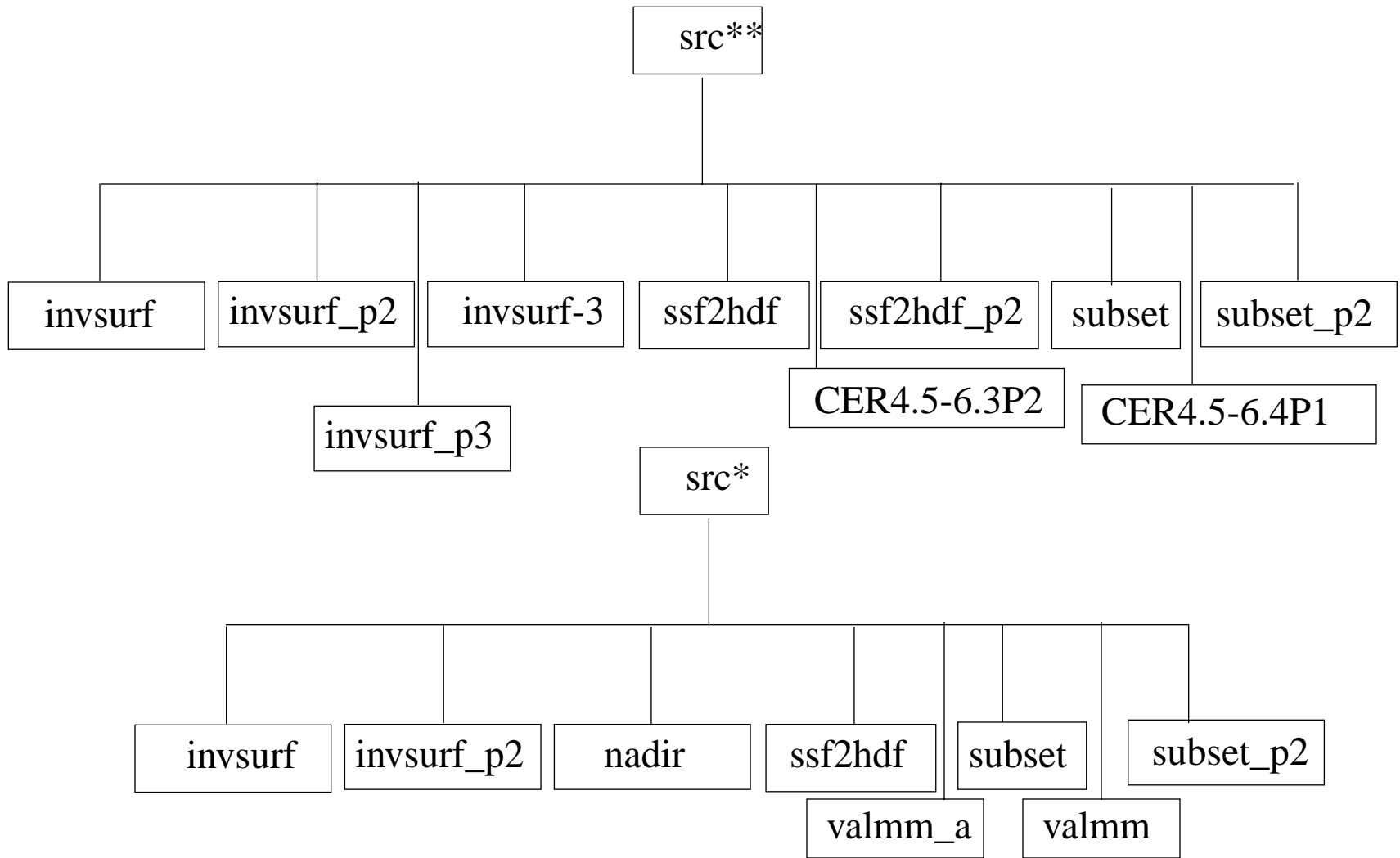


Figure B-1. Directory Structure for the Inversion Tar File (2 of 2)

Appendix C

File Description Tables

C.1 Production Scripts

The following scripts must be moved to the production environment.

Table C.1-1. PGE CER4.5-6.1P1 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.1P1.csh	ASCII	C-Shell script which creates the ASCII and PCF for the Main and HDF Processors
run_4.5-6.1P1.csh	ASCII	C-Shell script which executes the Main and HDF Processors
cleanup_4.5-6.1P1.csh	ASCII	C-Shell script which removes output files from CER4.5-6.1P1
diff_4.5-6.1P1.csh	ASCII	C-Shell script which compares the Log files and the *.met files
list_4.5-6.1P1.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.1P1.csh script
compile_4.5-6.1P1.csh	ASCII	C-Shell script which compiles the code for the Main and HDF Processors and the comparison software

Table C.1-2. PGE CER4.5-6.1P2 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.1P2.csh	ASCII	C-Shell script which creates the ASCII and PCF for the Main and HDF Processors
run_4.5-6.1P2.csh	ASCII	C-Shell script which executes the Main and HDF Processors
cleanup_4.5-6.1P2.csh	ASCII	C-Shell script which removes output files from CER4.5-6.1P2
diff_4.5-6.1P2.csh	ASCII	C-Shell script which compares the Log files and the *.met files
list_4.5-6.1P2.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.1P2.csh script
compile_4.5-6.1P2.csh	ASCII	C-Shell script which compiles the code for the Main and HDF Processors and the comparison software

Table C.1-3. PGE CER4.5-6.1P3 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.1P3.csh	ASCII	C-Shell script which creates the ASCII and PCF for the Main and HDF Processors
run_4.5-6.1P3.csh	ASCII	C-Shell script which executes the Main and HDF Processors
cleanup_4.5-6.1P3.csh	ASCII	C-Shell script which removes output files from CER4.5-6.1P3
diff_4.5-6.1P3.csh	ASCII	C-Shell script which compares the Log files and the *.met files
list_4.5-6.1P3.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.1P3.csh script
compile_4.5-6.1P3.csh	ASCII	C-Shell script which compiles the code for the Main and HDF Processors and the comparison software

Table C.1-4. PGE CER4.5-6.2P1 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.2P1.csh	ASCII	C-Shell script which creates the ASCII and PCF for the SSF Subset Postprocessor
run_4.5-6.2P1.csh	ASCII	C-Shell script which executes the SSF Subset Postprocessor
cleanup_4.5-6.2P1.csh	ASCII	C-Shell script which removes output files from CER4.5-6.2P1
diff_4.5-6.2P1.csh	ASCII	C-Shell script which compares the Log files and the *.met files
list_4.5-6.2P1.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.2P1.csh script
compile_4.5-6.2P1.csh	ASCII	C-Shell script which compiles the code for the SSF Subset Postprocessor and the subset comparison software

Table C.1-5. PGE CER4.5-6.2P2 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.2P2.csh	ASCII	C-Shell script which creates the ASCII and PCF for the SSF Subset Postprocessor
run_4.5-6.2P2.csh	ASCII	C-Shell script which executes the SSF Subset Postprocessor
cleanup_4.5-6.2P2.csh	ASCII	C-Shell script which removes output files from CER4.5-6.2P2
diff_4.5-6.2P2.csh	ASCII	C-Shell script which compares the Log files and the *.met files
list_4.5-6.2P2.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.2P2.csh script
compile_4.5-6.2P2.csh	ASCII	C-Shell script which compiles the code for the SSF Subset Postprocessor and the subset comparison software

Table C.1-6. PGE CER4.5-6.3P1 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.3P1.csh	ASCII	C-Shell script which creates the ASCII and PCF for the Alternate Main and HDF Processors
run_4.5-6.3P1.csh	ASCII	C-Shell script which executes the Alternate Main and HDF Processors
cleanup_4.5-6.3P1.csh	ASCII	C-Shell script which removes output files from CER4.5-6.3P1
diff_4.5-6.3P1.csh	ASCII	C-Shell script which compares the Log files and the *.met files for CER4.5-6.3P1
list_4.5-6.3P1.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.3P1.csh script
compile_4.5-6.3P1.csh	ASCII	C-Shell script which compiles the code for the Alternate Main and HDF Processors and the comparison software

Table C.1-7. PGE CER4.5-6.3P2 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.3P2.csh	ASCII	C-Shell script which creates the ASCII and PCF for the Alternate Main and HDF Processors
run_4.5-6.3P2.csh	ASCII	C-Shell script which executes the Alternate Main and HDF Processors
cleanup_4.5-6.3P2.csh	ASCII	C-Shell script which removes output files from CER4.5-6.3P2
diff_4.5-6.3P2.csh	ASCII	C-Shell script which compares the Log files and the *.met files for CER4.5-6.3P2
list_4.5-6.3P2.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.3P2.csh script
compile_4.5-6.3P2.csh	ASCII	C-Shell script which compiles the code for the Alternate Main and HDF Processors and the comparison software

Table C.1-8. PGE CER4.5-6.3P3 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.3P3.csh	ASCII	C-Shell script which creates the ASCII and PCF for the Alternate Main and HDF Processors for Aqua
run_4.5-6.3P3.csh	ASCII	C-Shell script which executes the Alternate Main and HDF Processors
cleanup_4.5-6.3P3.csh	ASCII	C-Shell script which removes output files from CER4.5-6.3P3
diff_4.5-6.3P3.csh	ASCII	C-Shell script which compares the Log files and the *.met files for CER4.5-6.3P3
list_4.5-6.3P3.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.3P3.csh script
compile_4.5-6.3P3.csh	ASCII	C-Shell script which compiles the code for the Alternate Main and HDF Processors and the comparison software

Table C.1-9. PGE CER4.5-6.4P1 Production Scripts

File Name	Format	Description
pcfgen_4.5-6.4P1.csh	ASCII	C-Shell script which creates the ASCII and PCF for the SSF monthly validation Subset Postprocessor
run_4.5-6.4P1.csh	ASCII	C-Shell script which executes the SSF monthly validation Subset Postprocessor
cleanup_4.5-6.4P1.csh	ASCII	C-Shell script which removes output files from CER4.5-6.4P1
diff_4.5-6.4P1.csh	ASCII	C-Shell script which compares the Log files and the *.met files
list_4.5-6.4P1.csh	ASCII	C-Shell script which lists out the files that should be created by the run_4.5-6.4P1.csh script
compile_4.5-6.4P1.csh	ASCII	C-Shell script which compiles the code for the SSF monthly validation Subset Postprocessor and the subset comparison software

C.2 Executables

Table C.2-1. PGE CER4.5-6.1P1 Executables

File Name	Format	Description
invsurf_p1.exe ¹	Binary	Main Processor executable
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-2. PGE CER4.5-6.1P2 Executables

File Name	Format	Description
invsurf_p2.exe ¹	Binary	Main Processor executable for Terra Processing
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable for Terra Processing

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-3. PGE CER4.5-6.1P3 Executables

File Name	Format	Description
invsurf_p3.exe ¹	Binary	Main Processor executable for Aqua Processing
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable for Aqua Processing

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-4. PGE CER4.5-6.2P1 Executable

File Name	Format	Description
subset_ssf.exe ¹	Binary	SSF Subset Post Processor executable

1. This file will be generated on execution of Subsystem software and is not included in the tar file.

Table C.2-5. PGE CER4.5-6.2P2 Executable

File Name	Format	Description
subset_ssf_p2.exe ¹	Binary	SSF Subset Post Processor executable
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable

1. This file will be generated on execution of Subsystem software and is not included in the tar file.

Table C.2-6. PGE CER4.5-6.3P1 Executables

File Name	Format	Description
invsurf_adm.exe ¹	Binary	Alternate Main Processor executable for TRMM
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-7. PGE CER4.5-6.3P2 Executables

File Name	Format	Description
invsurf-3p2.exe ¹	Binary	Alternate Main Processor executable for Terra
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-8. PGE CER4.5-6.3P3 Executables

File Name	Format	Description
invsurf-3p3.exe ¹	Binary	Alternate Main Processor executable for Aqua
ssf2hdf_p2.exe ¹	Binary	HDF Post Processor executable

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-9. PGE CER4.5-6.4P1 Executables

File Name	Format	Description
monthly_val_ssf.exe ¹	Binary	Monthly validation SSF Subset Post Processor executable

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

C.3 Status Message Files

Subsystems 4.5 and 4.6 software does not create any Status Message Files.

C.4 Processing Control Files (PCF) and Metadata Control Files (MCF)

The Process Control Files are not included in the Software Delivery Package. They will be created by the PCF generator scripts.

Table C.4-1. PGE CER4.5-6.1P1 Metadata Control Files

File Name	Format	Description
GQCA.MCF	ODL	MCF for ASCII QC Report for Main Processor
GQCI.MCF	ODL	MCF for Binary QC Report for Main Processor
SSF.MCF	ODL	MCF for SSF's HDF file for Post Processor
SSFB.MCF	ODL	MCF for Binary SSF file for Main Processor

Table C.4-2. PGEs CER4.5-6.1P2 and CER4.5-6.1P3 Metadata Control Files

File Name	Format	Description
GQCA.MCF	ODL	MCF for ASCII QC Report for Main Processor
GQCI.MCF	ODL	MCF for Binary QC Report for Main Processor
SSF.MCF	ODL	MCF for SSF's HDF file for Post Processor
SSFB.MCF	ODL	MCF for Binary SSF file for Main Processor
SSFA.MCF	ODL	MCF for Binary Aerosol file for Main Processor

Table C.4-3. PGE CER4.5-6.2P1 Metadata Control Files

File Name	Format	Description
SSFD.MCF	ODL	MCF for SSF DAYTIME Subset File
SSFN.MCF	ODL	MCF for SSF NIGHTTIME Subset File
SSFB.MCF	ODL	MCF for Binary SSF file for Main Processor
GQCA.MCF	ODL	MCF for ASCII QC Report for Main Processor
GQCI.MCF	ODL	MCF for Binary QC Report for Main Processor

Table C.4-4. PGE CER4.5-6.2P2 Metadata Control Files (1 of 2)

File Name	Format	Description
SSFD.MCF	ODL	MCF for SSF DAYTIME Subset File
SSFN.MCF	ODL	MCF for SSF NIGHTTIME Subset File

Table C.4-4. PGE CER4.5-6.2P2 Metadata Control Files (2 of 2)

File Name	Format	Description
SSFAD.MCF	ODL	MCF for SSF DAYTIME Aerosol Subset File
SSFB.MCF	ODL	MCF for Binary SSF file for Main Processor
GQCA.MCF	ODL	MCF for ASCII QC Report for Main Processor
GQCI.MCF	ODL	MCF for Binary QC Report for Main Processor
SSF.MCF	ODL	MCF for SSF's HDF file for Post Processor
SSFB-nadir.MCF	ODL	MCF for Binary SSF nadir product for Main Processor
SSF-nadir.MCF	ODL	MCF for HDF SSF nadir product for Post Processor
SSFB-val.MCF	ODL	MCF for Binary SSF nadir product for Main Processor

Table C.4-5. PGE CER4.5-6.3P1 Metadata Control Files

File Name	Format	Description
GQCI.MCF	ODL	MCF for Binary QC Report for Main Processor
SSFB.MCF	ODL	MCF for Binary SSF file for Main Processor
SSF.MCF	ODL	MCF for SSF's HDF file for Post Processor

Table C.4-6. PGE CER4.5-6.3P2 Metadata Control Files

File Name	Format	Description
GQCI.MCF	ODL	MCF for Binary QC Report for Alternate Processor
SSFB.MCF	ODL	MCF for Binary SSF file for Alternate Processor
SSFA.MCF	ODL	MCF for Binary SSF file for Alternate Processor
SSF.MCF	ODL	MCF for SSF's HDF file for Alternate Processor

Table C.4-7. PGE CER4.5-6.3P3 Metadata Control Files (1 of 2)

File Name	Format	Description
GQCI.MCF	ODL	MCF for Binary QC Report for Alternate Processor
SSFB.MCF	ODL	MCF for Binary SSF file for Alternate Processor

Table C.4-7. PGE CER4.5-6.3P3 Metadata Control Files (2 of 2)

File Name	Format	Description
SSFA.MCF	ODL	MCF for Binary SSF file for Alternate Processor
SSF.MCF	ODL	MCF for SSF's HDF file for Alternate Processor

Table C.4-8. PGE CER4.5-6.4P1 Metadata Control Files

File Name	Format	Description
SSFB-val.MCF	ODL	MCF for Binary SSF monthly validation Subset File
GQCA-val.MCF	ODL	MCF for ASCII station report.

Table C.4-9. PGE CER4.5-6.1P1 Process Control Files

File Name	Format	Description
CER4.5-6.1P1_PCF_TRMM-PFM-VIRS_SSIT_000000.1998050101 ¹	ASCII	Process Control File template for Main and Post Processors
CER4.5-6.1P1_PCFin_TRMM-PFM-VIRS_SSIT_000000.1998050101 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.1P1PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-10. PGE CER4.5-6.1P2 Process Control Files

File Name	Format	Description
CER4.5-6.1P2_PCF_TRMM-PFM-VIRS_SSIT_000000.2001041001 ¹	ASCII	Process Control File template for Main and Post Processors
CER4.5-6.1P2_PCFin_TRMM-PFM-VIRS_SSIT_000000.2001041001 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.1P2PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-11. PGE CER4.5-6.1P3 Process Control Files

File Name	Format	Description
CER4.5-6.1P3_PCF_TRMM-PFM-VIRS_SSIT_000000.2001041001 ¹	ASCII	Process Control File template for Main and Post Processors
CER4.5-6.1P3_PCFin_TRMM-PFM-VIRS_SSIT_000000.2001041001 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.1P3 PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-12. PGE CER4.5-6.2P1 Process Control Files

File Name	Format	Description
CER4.5-6.2P1_PCF_TRMM-PFM-VIRS_SSIT_000001.20000225 ¹	ASCII	Process Control File template for SSF Subset Post Processors
CER4.5-6.2P1_PCFin_TRMM-PFM-VIRS_SSIT_000001.20000225 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.2P1 PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-13. PGE CER4.5-6.2P2 Process Control Files

File Name	Format	Description
CER4.5-6.2P2_PCF_TRMM-PFM-VIRS_SSIT_000001.20010410 ¹	ASCII	Process Control File template for SSF Subset Post Processors
CER4.5-6.2P2_PCFin_TRMM-PFM-VIRS_SSIT_000001.20010410 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.2P2 PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-14. PGE CER4.5-6.3P1 Process Control Files

File Name	Format	Description
CER4.5-6.3P1_PCF_TRMM-PFM-VIRS_SSIT2_000001.1998050101 ¹	ASCII	Process Control File template for Alternate Main and Post Processors
CER4.5-6.3P1_PCFin_TRMM-PFM-VIRS_SSIT2_000001.1998050101 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.3P1PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-15. PGE CER4.5-6.3P2 Process Control Files

File Name	Format	Description
CER4.5-6.3P2_PCF_Terra-FM1-MODIS_SSIT_000000.2000030100 ¹	ASCII	Process Control File template for Alternate Main and Post Processors
CER4.5-6.3P2_PCF_Terra-FM1-MODIS_SSIT_000000.2000030100 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.3P2PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-16. PGE CER4.5-6.3P3 Process Control Files

File Name	Format	Description
CER4.5-6.3P3_PCF_Terra-FM1-MODIS_SSIT_000000.2000030100 ¹	ASCII	Process Control File template for Alternate Main and Post Processors for Aqua
CER4.5-6.3P3_PCF_Terra-FM1-MODIS_SSIT_000000.2000030100 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.3P3PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.4-17. PGE CER4.5-6.4P1 Process Control Files (1 of 2)

File Name	Format	Description
CER4.5-6.4P1_PCF_Terra-FM1-MODIS_Edition1A_020021.200011 ¹	ASCII	Process Control File template for monthly validation Subset Post Processors

Table C.4-17. PGE CER4.5-6.4P1 Process Control Files (2 of 2)

File Name	Format	Description
CER4.5-6.4P1_PCFin_Terra-FM1-MODIS_Edition1A_020021.200011 ¹	ASCII	ASCII file created by the PCF file generator used to create the CER4.5-6.4P1PCF file

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

C.5 SSF HDF Read Software

Table C.5-1. SSF HDF Read Software Files

File Name	Format	Description
SSF_readhdf_daacv3.c	ASCII	main program which accesses the HDF reading functions.
SSF_readHDFfuncs_daacv3.c	ASCII	C functions that are linked with 'readhdf.c' and calls the HDF functions
SSF_HDFread_daacv3.h	ASCII	header file for 'readhdf.c' and the HDF libraries.
compile_SSF_readhdf_daacv3	ASCII	script to compile the C programs in a UNIX environment. The script must be modified for different platforms to proper
README_SSF_daacv3	ASCII	informational file

C.6 Ancillary Input Data

Table C.6-1. PGE CER4.5-6.1P1 Ancillary Input Data (1 of 3)

File Name	Format	Description
IGBP_mod_all.YYYYMMDD ¹	ASCII	SW Draft ADM input file
IISCOLD.YYYYMMDD ¹	Binary	Spectral Correction Ancillary Data
ceres_SI_PFM_day.YYYYMMDD ¹	ASCII	Daytime Slope-Intercept Spectral Correction Coefficients for TRMM PFM

Table C.6-1. PGE CER4.5-6.1P1 Ancillary Input Data (2 of 3)

File Name	Format	Description
ceres_SI_PFM_night.YYYYYMMDD ¹	ASCII	Nighttime Slope-Intercept Spectral Correction Coefficients for TRMM PFM
ceres_SI_FM1_day.YYYYYMMDD ¹	ASCII	Daytime Slope-Intercept Spectral Correction Coefficients for Terra FM1
ceres_SI_FM1_night.YYYYYMMDD ¹	ASCII	Nighttime Slope-Intercept Spectral Correction Coefficients for Terra FM1
ceres_SI_FM2_day.YYYYYMMDD ¹	ASCII	Daytime Slope-Intercept Spectral Correction Coefficients for Terra FM2
ceres_SI_FM2_night.YYYYYMMDD ¹	ASCII	Nighttime Slope-Intercept Spectral Correction Coefficients for Terra FM2
adm_groups.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
adm_land_cld.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
adm_oceclld.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
admws.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
albm_n_groups.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
albm_n_land_cld.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
albm_n_oceclld.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
albm_nws_th.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
bbalbbrdf_aer_atm_allws.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
clear_snow_radiance.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
cloudy_snow_radiance.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
clr_oce_key.YYYYYMMDD ¹	ASCII	SW Draft ADM Input File
erbetoa_csalb_clim.YYYYYMMDD ¹	Binary	ERBE Clear-sky Albedo Table
lwwndy_bcfdes_admed2.YYYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwndy_bcfld_admed2.YYYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwndy_bcfocn_admed2.YYYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwndy_cskydes_admed2.YYYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwndy_cskyld_admed2.YYYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwndy_cskyocn_admed2.YYYYYMMDD ¹	ASCII	LW and WN Draft ADMs

Table C.6-1. PGE CER4.5-6.1P1 Ancillary Input Data (3 of 3)

File Name	Format	Description
lwwndy_ovc_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_bcfdes_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_bcfInd_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_bcfofn_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_cskydes_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_cskyInd_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_cskyocn_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
lwwnnt_ovc_admed2.YYYYMMDD ¹	ASCII	LW and WN Draft ADMs
ws_pctil.YYYYMMDD ¹	ASCII	SW Draft ADM input file

1. YYYY - 4 digit year

MM - 2 digit month {valid values: 01 .. 12}

DD - 2 digit day {valid values: 01 .. 31}

Table C.6-2. PGE CER4.5-63P2 and CER4.5-63P3 Ancillary Input Data (1 of 5)

File Name	Format	Description
IGBP_mod_all.map.YYYYMMDD ¹	ASCII	Terra ADM Input File
IISCOLD.YYYYMMDD ¹	Binary	Spectral Correction Ancillary Data
SS5_GFDLAerClim_YYYYMM ¹	Binary	SW Model A Surface Flux Input File
VIRS-Ch1F-Lut-MLS-Ws_01.00-Wa_000-ang15	ASCII	Aerosol Correction File
VIRS-Ch2F-Lut-MLS-Ws_01.00-Wa_000-ang15	ASCII	Aerosol Correction File
ceres_SI_PFM_day.YYYYMMDD ¹	ASCII	Daytime Slope-Intercept Spectral Correction Coefficients for TRMM PFM
ceres_SI_PFM_night.YYYYMMDD ¹	ASCII	Nighttime Slope-Intercept Spectral Correction Coefficients for TRMM PFM
ceres_SI_FM1_day.YYYYMMDD ¹	ASCII	Daytime Slope-Intercept Spectral Correction Coefficients for Terra FM1

Table C.6-2. PGE CER4.5-63P2 and CER4.5-63P3 Ancillary Input Data (2 of 5)

File Name	Format	Description
ceres_SI_FM1_night.YYYYMMDD ¹	ASCII	Nighttime Slope-Intercept Spectral Correction Coefficients for Terra FM1
ceres_SI_FM2_day.YYYYMMDD ¹	ASCII	Daytime Slope-Intercept Spectral Correction Coefficients for Terra FM2
ceres_SI_FM2_night.YYYYMMDD ¹	ASCII	Nighttime Slope-Intercept Spectral Correction Coefficients for Terra FM2
adm_groups.dat2b.YYYYMMDD ¹	ASCII	Terra ADM Input File
adm_land_cld.dat2b.YYYYMMDD ¹	ASCII	Terra ADM Input File
admcsky_terra_lwwn.dat.YYYYMMDD ¹	ASCII	Terra ADM Input File
admcsky_terra_lwwn_dy_ed1a.dat.YYYYMMDD ¹	ASCII	Terra ADM Input File
admcsky_terra_lwwn_nt_ed1a.dat.YYYYMMDD ¹	ASCII	Terra ADM Input File
admcsky_terra_lwwn_nt.dat.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-lw-terra-beta5-all-day.offset.YYYYMMDD ¹	ASCII	Terra ADM Input File
albm_n_land_cld.out2b.YYYYMMDD ¹	ASCII	Terra ADM Input File
albm_n_groups.out2b.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-lw-terra-ed2-all-day.par.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-lw-terra-ed2-all-day.offset.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-lw-terra-ed2-all-nt.par.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-1w-terra-ed2-all-nt.offset.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-sw-terra-ed2-all.offset.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-sw-terra-ed2-all.par.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-wn-terra-ed2-all-day.offset.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-wn-terra-ed2-all-day.par.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-wn-terra-ed2-all-nt.offset.YYYYMMDD ¹	ASCII	Terra ADM Input File
ann-wn-terra-ed2-all-nt.par.YYYYMMDD ¹	ASCII	Terra ADM Input File
descld_lwflx_allpw.fit.YYYYMMDD ¹	Binary	Terra ADMs

Table C.6-2. PGE CER4.5-63P2 and CER4.5-63P3 Ancillary Input Data (3 of 5)

File Name	Format	Description
descld_lwflx_nit_allpw.YYYYYMMDD ¹	Binary	Terra ADM Input File
descld_lwrad_allpw.fit.YYYYYMMDD ¹	Binary	Terra ADM Input File
descld_lwrad_nit_allpw.fit.YYYYYMMDD ¹	Binary	Terra ADM Input File
descld_wnflx_allpw.fit.YYYYYMMDD ¹	ASCII	Terra ADM Input File
descld_wnflx_nit_allpw.fit.YYYYYMMDD ¹	ASCII	Terra ADMs
descld_wnrad_allpw.fit.YYYYYMMDD ¹	ASCII	Terra ADMs
descld_wnrad_nit_allpw.fit.YYYYYMMDD ¹	ASCII	Terra ADMs
erbetoa_csalb_clim.YYYYYMMDD ¹	Binary	ERBE Clear-sky Albedo Table
fits_01.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_02.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_03.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_04.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_05.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_06.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_07.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_08.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_09.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_10.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_11.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fits_12.dat.YYYYYMMDD ¹	ASCII	Terra ADMs
fresh_snow_adm.dat.YYYYYMMDD ¹	ASCII	LW and WN Edition2B ADMs
fresh_snow_adm_lw.dat.YYYYYMMDD ¹	ASCII	LW and WN Edition2B ADMs
fresh_snow_adm_lw_night.dat.YYYYYMMDD ¹	ASCII	LW and WN Edition2B ADMs
fresh_snow_adm_wn.dat.YYYYYMMDD ¹	ASCII	LW and WN Edition2B ADMs
fresh_snow_adm_wn_night.dat.YYYYYMMDD ¹	ASCII	LW and WN Edition2B ADMs
fuliou.dat.YYYYYMMDD ¹	ASCII	Terra ADMs

Table C.6-2. PGE CER4.5-63P2 and CER4.5-63P3 Ancillary Input Data (4 of 5)

File Name	Format	Description
Indcld1_swflx.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld1_swrad.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld2_swflx.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld2_swrad.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld3_swflx.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld3_swrad.fit.YYYYMMDD ³ ¹	ASCII	Terra ADMs
lIndcld_lwflx_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld_lwflx_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
lIndcld_lwrad_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld_lwrad_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
lIndcld_wnflx_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld_wnflx_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
lIndcld_wnrad_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
Indcld_wnrad_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
ocecld1_swflx.fit..YYYYMMDD ¹	ASCII	Terra ADMs
ocecld1_swrad.fit..YYYYMMDD ¹	ASCII	Terra ADMs
ocecld2_swflx.fit..YYYYMMDD ¹	ASCII	Terra ADMs
ocecld2_swrad.fit..YYYYMMDD ¹	ASCII	Terra ADMs
ocecld3_swflx.fit..YYYYMMDD ¹	ASCII	Terra ADMs
ocecld3_swrad.fit..YYYYMMDD ¹	ASCII	Terra ADMs
ocecld_lwflx_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
ocecld_lwflx_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
ocecld_lwrad_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
ocecld_lwrad_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
ocecld_wnflx_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
ocecld_wnflx_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs

Table C.6-2. PGE CER4.5-63P2 and CER4.5-63P3 Ancillary Input Data (5 of 5)

File Name	Format	Description
oceclد_wnrad_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs
oceclد_wnrad_nit_allpw.fit.YYYYMMDD ¹	ASCII	Terra ADMs_nit
oceclr_adm_trmmterra.dat_nak.YYYYMMDD ¹	ASCII	Terra ADMs
oceclrth.dat.nak.YYYYMMDD ¹	ASCII	Terra ADMs
permanent_snow_adm.dat.YYYYMMDD ¹	ASCII	Terra ADMs
permanent_snow_adm_lw.dat.YYYYMMDD ¹	ASCII	Terra ADMs
permanent_snow_adm_lw_night.dat.YYYYMMDD ¹	ASCII	Terra ADMs
permanent_snow_adm_wn.dat.YYYYMMDD ¹	ASCII	Terra ADMs
permanent_snow_adm_wn_night.dat.YYYYMMDD ¹	ASCII	Terra ADMs
rayleigh_lim.dat.YYYYMMDD ¹	ASCII	Terra ADMs
seaice_adm.dat.YYYYMMDD ¹	ASCII	Terra ADMs
seaice_adm_lw.dat.YYYYMMDD ¹	ASCII	Terra ADMs
seaice_adm_lw_night.dat.YYYYMMDD ¹	ASCII	Terra ADMs
seaice_adm_wn.dat.YYYYMMDD ¹	ASCII	Terra ADMs
seaice_adm_wn_night.dat.YYYYMMDD ¹	ASCII	Terra ADMs

1. YYYY - 4 digit year

MM - 2 digit month {valid values: 01 .. 12}

DD - 2 digit day {valid values: 01 .. 31}

C.7 Output Temporary Data Files (Production Results)

Table C.7-1. Output Temporary Data Files

File Name ²	Format	Description
\$CERESHOME/inversion/data/scr/MCF-Write.temp.SS_PS_CC.YYYYMMDDHH ¹	ASCII	Temporary file created by the Toolkit
\$CERESHOME/inversion/data/scr/MCF-Write.temp.SS_PS_CC.YYYYMMDD ¹	ASCII	Temporary file created by the Toolkit

1. These files will be generated on execution of Subsystem software and are not included in the tar file.

2. YYYY - 4 digit year

MM - 2 digit month {valid values: 01 .. 12}

DD - 2 digit day {valid values: 01 .. 31}

HH - 2 digit hour of the day {valid values: 00 .. 23}

SS - Sampling Strategy

PS - Production Strategy

CC - Configuration Code